

**IN THE CLAIMS:**

1.     **(Currently Amended)** An optical waveguide, comprising:  
  
a silica substrate;  
  
a **first** buffer layer provided on the silica substrate, **the first buffer layer having a thickness of not less than 1  $\mu\text{m}$  and not more than 5  $\mu\text{m}$** ;  
  
at least one core provided on the **first** buffer layer; and  
  
an upper cladding layer provided on the **first** buffer layer and covering the core,  
  
~~in which~~ **wherein** a thermal expansion coefficient of the **first** buffer layer and a thermal expansion coefficient of the upper cladding layer are substantially equal.
2.     **(Currently Amended)** The optical waveguide as claimed in claim 1, wherein a refractive index of the **first** buffer layer is higher than a refractive index of the silica substrate.
3.     **(Currently Amended)** The optical waveguide as claimed in claim 1, wherein a softening temperature of the upper cladding layer is lower than a softening temperature of the **first** buffer layer.
4.     **(Currently Amended)** The optical waveguide as claimed in claim 2, wherein a softening temperature of the upper cladding layer is lower than a softening temperature of the **first** buffer layer.
5.     **(Original)** The optical waveguide as claimed in claim 3, wherein at least boron (B) and phosphorus (P) are added to the upper cladding layer.

6. **(Original)** The optical waveguide as claimed in claim 4, wherein at least boron (B) and phosphorus (P) are added to the upper cladding layer.

7. **(Currently Amended)** The optical waveguide as claimed in claim 5, wherein at least germanium (Ge) is added to the **first** buffer layer.

8. **(Currently Amended)** The optical waveguide as claimed in claim 6, wherein at least germanium (Ge) is added to the **first** buffer layer.

9. **(Canceled)**

10. **(Currently Amended)** The optical waveguide as claimed in claim 1, further comprising ~~another~~ **a second** buffer layer interposed between the silica substrate and the ~~above~~ **first** buffer layer, a thermal expansion coefficient of the ~~another~~ **second** buffer layer **is being** between a thermal expansion coefficients of the silica substrate and the ~~above~~ **first** buffer layer.

11. **(Withdrawn)** A method of fabricating an optical waveguide, comprising the steps of:

forming a buffer layer on a silica substrate by using a vapor phase deposition;

forming a core layer on the buffer layer by using a vapor phase deposition;

forming first and second cores by patterning the core layer;

forming an upper cladding layer covering the first and second cores by using a vapor phase deposition, said upper cladding layer having a thermal expansion coefficient that is substantially equal to that of the buffer layer; and

annealing the upper cladding layer to fluidize.

12. **(Withdrawn)** The method of fabricating an optical waveguide as claimed in claim 11, wherein the upper cladding layer are deposited and annealed with multiple steps.

13. **(New)** The optical waveguide as claimed in claim 3, wherein at least germanium (Ge) is added to the first buffer layer.

14. **(New)** The optical waveguide as claimed in claim 4, wherein at least germanium (Ge) is added to the first buffer layer.

15. **(New)** The optical waveguide as claimed in claim 10, wherein a refractive index of the first buffer layer is higher than a refractive index of the silica substrate.

16. **(New)** The optical waveguide as claimed in claim 10, wherein a softening temperature of the upper cladding layer is lower than a softening temperature of the first buffer layer.

17. **(New)** The optical waveguide as claimed in claim 15, wherein a softening temperature of the upper cladding layer is lower than a softening temperature of the first buffer layer.

18. **(New)** The optical waveguide as claimed in claim 16, wherein at least boron (B) and phosphorus (P) are added to the upper cladding layer.

19. **(New)** The optical waveguide as claimed in claim 17, wherein at least boron (B) and phosphorus (P) are added to the upper cladding layer.

20.     **(New)** The optical waveguide as claimed in claim 16, wherein at least germanium (Ge) is added to the first buffer layer.

21.     **(New)** The optical waveguide as contained in claim 17, wherein at least germanium (Ge) is added to the first buffer layer.

22.     **(New)** The optical waveguide as claimed in claim 18, wherein at least germanium (Ge) is added to the first buffer layer.

23.     **(New)** The optical waveguide as claimed in claim 19, wherein at least germanium (Ge) is added to the first buffer layer.